Harkness, W. J. K.

# Report on the Sturgeon Situation in Manitoba.

MANITOBA
DEPARTMENT OF NATURAL RESOURCES

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# REPORT ON THE STURGEON SITUATION IN MANITOBA

by

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Report on the sturgeon situation in Manitoba.

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## EDITOR'S ABSTRACT

This manuscript report has been on file in the Department since March, 1936, and has been issued as an item of historic interest. Only very minor editorial changes have been made to the original manuscript. Dr. William J. K. Harkness reviews the historical aspects of the lake sturgeon fishery in Manitoba between 1876 and 1935 and makes several recommendations for managing the sturgeon fishery.

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*University of Toronto*

TORONTO 5, CANADA

DEPARTMENT OF BIOLOGY

March 24th., 1936

Mr. A. G. Cunningham, Director,
Game and Fisheries Branch,
Parliament Buildings,
Winnipeg, Manitoba.

Dear Mr. Cunningham:

I have at hand your letter of January 23, 1936. During the intervening two months I have been giving it a good deal of consideration. I shall now answer it directly and enclose with the answer a report on the sturgeon situation in Manitoba.

The contents of this letter and report are yours to use as discretion dictates. You may publish or make public all or any part or parts, as you may require to use them to the advantage of the fishery resources of Manitoba. I stand prepared to back the report <u>as a whole</u> but <u>not in any individual part</u> as separated from the whole. In making public any part I depend upon your discretion to protect me from misunderstanding that might arise by taking a statement from its context in such a way that the meaning might be falsely construed.

In reply to your second paragraph, I would say that Ontario and Saskatchewan are much more likely to furnish spawning grounds for Manitoba sturgeon. Sturgeon usually ascend streams for the purpose of spawning returning to the lakes for the summer. Most rivers and streams flow from Ontario and Saskatchewan into Manitoba. Fishermen and poachers in Ontario and Saskatchewan may take sturgeon on their spawning runs which have been fed and fattened in

Manitoba lakes.

After looking over the sturgeon statistics for Manitoba and perusing the graph produced therefrom, I cannot possibly see where your fishermen could take any amount of nearly 200,000 pounds a year, for three years, unless they opened up some altogether new lakes, and at the same time fished the known lakes so vigorously as to bring about extinction of the sturgeon from the commercial aspect at least. This is the case if the statistical records present anywhere nearly the true situation.

An amount of sturgeon equal to or in excess of this amount of 200,000 pounds has been taken only three times in the last thirty years and only eleven times in the history of Manitoba.

If there are any parts of the enclosed report of which the meaning is not perfectly clear, or if there is any further information that I can give you I shall be glad to head from you in that respect.

Yours very truly,

ORIGINAL SIGNED BY

*"William J. K. Harkness"*

P.S. Wording, construction, syntax etc. is not carefully prepared as for a scientific paper, more consideration being given to the problem and the facts than to the smoothness of the grammer etc.

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# REPORT ON THE STURGEON SITUATION IN MANITOBA

## INTRODUCTION

The present report is in response to a request from Mr. A. G. Cunningham, Director of the Game and Fisheries Branch of the Province of Manitoba. In it there is presented information on the sturgeon, Acipenser fulvescens, of the province, which may be used for the purpose of formulating fishery regulations to control the taking of that species.

## STATISTICS

In analysing the status of a fishery at any given time, it is of great value to know the statistical history of the fishery up to that time. Recourse was had to the reports and statistics of the federal Department of Fisheries and Bureau of Statistics. It is assumed that these are relatively accurate and depict fairly the situation. Data obtained from these sources have been utilized in the preparation of the accompanying tables and graphs. These are not meant to be minutely accurate, but are no doubt as accurate as the data from which they were obtained.

The advantage of using tables and graphs to represent the situation relative to sturgeon is that they give a pictorial representation of the status of the fishery which is difficult to obtain otherwise.

There are many facts relating to the local conditions which have a direct bearing on the sturgeon fishery, such as the extent

of water inhabited by sturgeon, the means of taking and handling the sturgeon, the means of transportation, the cost of placing them on the market, the number of fishermen operating, the amount of gear utilized in taking sturgeon, and the state of prosperity or depression among the fishermen. Information is not available upon these points. Such information is essential for a proper analysis of the situation and for the purpose of proposing a plan for a sturgeon fishery which is practical in all of its details.

## HISTORICAL ANALYSIS OF THE STURGEON SITUATION

Previous to the completion of a railroad connecting Winnipeg to other centres there was small demand for sturgeon. The local consumption was practically negligible and difficulties of transportation made extensive export impracticable. With the completion of the railroad to St. Paul, Minnesota, in 1878 there appears to have been some slight development of a sturgeon fishery, but as there are no statistics available which cover this period the extent of the fishery is problematical.

With the completion of the C.P.R. between Winnipeg and Port Arthur in 1885 and to the east in 1887, two additional forces came into play. The whole province was being opened up and developed rapidly, and new equipment could be brought in. The fishermen began to realize that there was a market for sturgeon, that they could be assured of getting some return, and so began to fish them casually.

During the next ten years it appears that the fishing effort continued to increase at an even tenor and the fishery was not developed too rapidly.

In 1898 the report from Manitoba is that "Sturgeon much sought after, increase in number of licenses, falling off in catch. Last half of season fishing unprofitable, many fishermen not making wages."

This must have been a very local condition or a misinterpretation of facts, because immediately following this there was a sudden great expansion and promotion of the fishery, and sturgeon production reached a peak in Manitoba. This fishery was pressed so vigorously that it almost amounted to a slaughter, and the immediate depletion and fall-off in catch which resulted was inevitable.

In 1901 Manitoba reports, "Sturgeon have not done so well. There is a falling-off in the catch of these valuable fish." Following this the price of sturgeon was just doubled and even in the face of this statement the fishing effort was still more vigorously pressed.

During this period Manitoba was enjoying great prosperity, and developing its natural resources at a rapid rate. The sturgeon fishery was being developed in all parts of Canada. Many Canadian waters were already feeling the strain and the sturgeon supply was showing the first signs of depletion. Manitoba with great expanses of virgin waters teeming with sturgeon stepped in to fill this demand created by the diminishing supply from other waters.

In spite of the continued high prices and intensive fishing on Lake Winnipeg and other lakes and rivers the total production of sturgeon, by Manitoba, fell off at an alarming rate.

In 1910 Lac du Bonnet was opened up and exploited to the extent of 173,000 pounds of sturgeon in the one year.

This Lac du Bonnet fishery of 1910 was the one and only check to the disastrously precipitous fall-off in the sturgeon catch, almost amounting to a catastrophy, that occurred from 1900 to 1910. By 1910 the trend towards depletion was sufficiently marked to arouse the authorities to action and the sturgeon fishery was closed.

The fishery remained closed until 1916 when it was opened as a war measure. Intensive fishing occurred and there were good catches for three years. The catch then fell off to depletion of the stock and also to a letting-up in the fishing effort since the "war need" had passed.

The very high prices of 45 to 60 cents a pound which maintained from 1922 to 1928 again brought on intensive fishing which resulted in a positive and rapid depletion of the stock, and a falling-off in catch in spite of the fact that the prices were actually increasing.

If the fishing had persisted at this intensity, without a stop, for another ten years, it is likely that the sturgeon in these waters would be practically extinct.

## HABITS OF THE STURGEON

Studies of the sturgeon have been carried on by the writer over a number of years. Information obtained in this manner has been augmented by studies of other investigators and information from fishermen, Indians and others familiar with this fish.

When the sturgeon reaches a size of 40 to 45 inches it becomes sexually mature. Fish in this condition ascend streams early in the spring, when the temperature of the water in the stream reaches about 56°F. They deposit their eggs in the swift water at the foot of some insurmountable rapid or fall. Such is the customary spawning

site. In from five to ten days the eggs hatch and the young gradually make their way down stream towards the lake.

After the spawning the adult fish returns to the lake where they spend the rest of the summer and the succeeding winter. In certain locations sturgeon do not spawn in rapids but in some lakes they apparently may spawn in the shallow water near the shore.

Sturgeon do not all leave the rivers in the summer. Some large sturgeon do live in rivers at all times. This is particularily true of large rivers such as the St. Lawrence, the Saskatchewan, the Abitibi, the Moose and the Nelson. Only the small sturgeon spend the summers in small streams.

The sturgeon grow slowly. Investigations of the writer indicate that from hatching it takes the sturgeon from 22 to 25 years to reach sexual maturity.

In its movements and feeding range the sturgeon is confined to a limited area. It is rarely found in depths of water greater than twenty feet. This has the effect of bringing about a concentration of sturgeon in the shallower areas of a lake, and regardless of the size of the lake the sturgeon production is related to and dependent upon the amount of area of shallow water in which it may live and feed successfully. During the spawning movements the sturgeon have a tendency to congregate, large numbers being present in a confined area.

## RELATION OF THE LIFE HISTORY TO THE STURGEON FISHERY

In the face of intensive fishing it is almost impossible for a fish, which grows as slowly as the sturgeon, to maintain its numbers. If allowed to reproduce naturally the time which elapses between the hatching of the egg and when the fish grows to a catchable size of 50 inches,

is so great that it just will not sustain a continuous heavy fishing effort.

Artificial propagation is of no value in overcoming this difficulty for two very obvious reasons. Even if there was any assurance that artificial propagation could produce a more efficient hatch than natural propagation, the period of wait between planting the fry and reaping the results in a crop of catchable fish, is too long. The hazards through which the growing fish must pass in the interim too great to make such procedure at all practicable. At present so little is known about the life of the sturgeon that there is positively no information to show that a natural hatch is not as successful or perhaps more successful than an artificial hatch. If the practice of artificial propagation was introudced, it might, as it has in the case of some other species of fish, create a feeling of false security and assurance since that a method had been devised of maintaining a supply of stock had been devised there was no longer any danger of depleting the supply and they could be fished vigorously. This is one of the most certain methods of bringing about extinction of the species just as occurred in the case of the Atlantic salmon in Lake Ontario.

The adult sturgeon being congregated as they are in the shallow areas of the lake, fall easy prey to the fishermen who can confine their energy to the small areas of shallow water which are so readily fished. This makes them very susceptible to extermination by an intensive fishery.

While moving towards their spawning beds or concentrated upon them, the sturgeon are exposed to two destructive factors. Fishermen and Indians can practically wipe out a spawning school in one year by the intensive use of nets, set-lines or spears, set or used at strategic

points. A dam or pollution interfering with the natural flow or conditions at a spawning bed will have the same result.

## HATCHERY PRACTICE AND ITS APPLICATION

In 1924 the writer was successful in obtaining ripe eggs from a spawning female, by cutting open the fish and taking out the ovary. These eggs were fertilized by expressing milt from male sturgeon and stirring it gently with the eggs. The fertilized eggs were then placed in floating hatchery boxes, which were floated in the river. The eggs hatched in from five to eight days. The fry were transferred to aquaria and kept for thirty days after hatching. At the end of that time they were one inch long. Over 100,000 fry were successfully hatched in this manner, of which between 70,000 and 80,000 were released into the "spawning stream."

Hatching is relatively easy, simple and successfuly with small numbers of eggs, when carried out by this method. The fungus disease, Saprolegnia, is the only factor which seriously interfered with the complete success of the hatch.

This method of culture has no significant economic value for the fishery, in view of the reasons given above and also because in obtaining the eggs it is necessary to kill the female, and then not all of the eggs in the ovary can be used as they do not all ripen at the same time but the period of ripening extends over a few days.

It is reasonable to suppose that it would be much more advantageous for the fishery to allow the female sturgeon to live and to "spawn out" successfully all of her eggs, and then perhaps live to return again and spawn 200,000 eggs in a later year.

It was found that the naturally spawned eggs when taken in nets set below the spawning beds were practically 100 per cent fertilized.

## THE RESULTS FROM A THEORETICAL FISHERY POLICY UNDER SCIENTIFIC CONTROL

From 1885 to 1929 covering a fishing period of 34 years there was a total catch of sturgeon taken from Lake Winnipeg and tributaries of 6,029,860 pounds with a value of $628,085.[1] This is an average of about 177,348 pounds per year at about 10 cents per pound.

If at the inception of the fishery an annual maximum of 100,000 pounds had been established for the sturgeon catch, if there had been no closed season since that time, and if the limit of 100,000 pounds had been taken each year up to 1936 and had been disposed of at the prevailing current price, the total catch from Lake Winnipeg would have been 4,700,000 pounds with a value of $847,000 instead of a catch of 6,029,860 pounds with a value of $628,085 actually a saving of 1,229,860 pounds of sturgeon at a profit of $218,915.

Applying the same argument to the province as a whole the following result is obtained. The catch was 7,400,860 pounds at a value of $1,293,812. Under the other plan it would have been 4,700,00 pounds at a value of $847,000. Here the saving is 2,700,860 sturgeon but at a loss of $446,812.

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[1] For purposes of convenience the catch for and the years themselves are being ignored,-1890, 1891, 1897, 1905 , -as the data for these years are not available. The exclusion of these data will have no appreciable effect upon the final result.

In the first instance if the fishery had been spread over all of the sturgeon area of the lake and not fished to depletion at any one part, the actual value in production would have been increased, there would have been a continuous fishery supplying employment and a steady supply of fish to the market, the supply of sturgeon in the lake would have been conserved so that there would at present be a good stock of sturgeon in those waters and fishing could be continuous.

The latter instance appears on the surface to represent a real loss. If a fishery of this type had been allowed to operate generally, spreading its effort over all of the sturgeon producing waters and not fishing to near depletion any one area, there would never have arisen any necessity for a closed season, and at the present time there would be an excellent stock of sturgeon in these waters which would be sufficient to support a fishery of 100,000 pounds a year for many years to come and perhaps indefinitely. As it is the waters of Manitoba now will not support a sturgeon fishery of anything over 30,000 pounds a year and that for only a few years. Any fishery for sturgeon which is started in Manitoba at the present time should be on the basis of 10,000 pounds a year and it should be very carefully conducted so as not to bring about extinction of this fish. In the long run the controlled fishery of 100,000 pounds a year would have produced many more fish, much more money and employment.

## RECOMMENDATIONS

There are at least three lines of action for the establishment of a sturgeon fishery policy any one of which may be followed.

1. A general open commercial season for sturgeon may be allowed and licenses granted to a number of fishermen. In this case the fishermen operating will concentrate their efforts on the limited areas where the sturgeon are congregated. They will fish these areas intensively and will doubtless take a large number of fish. This will result in a marked depletion approaching extermination if it is pursued for any length of time.

If the fishery is opened in this way, I would predict that the amount of 200,000 pounds would never be taken in one year or if it was that it would be taken in one year only.

150,000 pounds might be taken for two years

100,000 pounds might be taken for four years

50,000 pounds might be taken for eight years

30,000 pounds might be taken for twelve years

After these various periods the sturgeon fishery would just "fold up" excepting for those hardy souls who can carry on and make money on a shoe-string or the optimists who hold on at a loss hoping that the sturgeon will come back from somewhere when someone at Winnipeg or Ottawa waves some kind of magic wand.

An open fishery on a 10,000 pound basis might persist if it was sufficiently diffuse in effort.

2. A continuous closed season. If there is a closed season on commercial fishing, if the sturgeon are not otherwise interfered with, (such as by Indians on the spawning area) and other conditions are favourable for sturgeon growth and reproduction (such as absence of dams in

their spawning streams and freedom from pollution of their spawning and feeding beds) they will gradually build up a stock over a period of 20, 30, 40, or 50 years. After such a stock has been built up the sturgeon will stand the fishing of a moderate but strictly controlled open season for commercial fishing. If fishing is in any way intense depletion will again occur.

The waters of Manitoba will never stand up under a sturgeon fishery of 200,000 pounds a year.

3. A controlled sturgeon fishery. Such a fishery should be established on a sound commonsense business and a biological basis. It should have as its purpose the taking of an annual crop of sturgeon. This catch should be of the same poundage year after year. The catch should be as large as the stock will supply but it should be no larger, that is care must be taken not to cause a depletion of the stock beyond its power to recover. The sturgeon should be cropped not mined.

For such a fishery to be a success it is essential that politics be completely divorced from it. The sturgeon fishing permit must be given to one man or one group of men to operate over a number of years so that they will be interested in carrying on their fishery in such a fashion as to retain their license and so that their supply will be continuous for years. Such a licensee must be trustworthy, reputable and intelligent so that your Department may depend upon him and so that he will know what it is all about and understand it and appreciate how he can utilize such a plan for his own profit, and the good of the sturgeon at the same time.

The fishing must not be intense at any one spot over any length of time. There must be a gradual movement from one sturgeon area to another fishing each one for only one year or a part of one year in

the course of ten years.

Under present conditions the water of Manitoba will not sustain a sturgeon fishery of over 10,000 pounds a year. If there is any idea of opening the sturgeon season in Manitoba with the hope of retaining any on the sturgeon, the only possible way to do it is to limit the catch to 10,000 pounds a year or less, to prohibit the intensive fishing in any one restricted area, and to permit sturgeon fishing in any one area only once in every eight or ten years.

After eight or ten years of such a fishery there would be a considerable amount of additional information at hand and it would then be possible to reconsider the question and probably modify the catch, possibly raising it to 12,000 to 15,000 pounds per year. It is extremely important that such a fishery should start low, not over 10,000 pounds and that it should remain steady at that figure for a number of years.

It is immaterial if the 10,000 pounds of fish are taken during one month or three months. The most economic method should be used, but certainly no sturgeon should be taken between May 1 and July 1 or perhaps in northern Manitoba not before July 10.

## PRECAUTION

While attention is being given to the control of the commercial fishery, the waters in which the sturgeon are living, feeding and spawning should be carefully guarded.

Pollution from mines, smelters, pulp and paper mills, saw mills, factories and towns should not be allowed to spoil the feeding and spawning beds. Dams should not be constructed where they will interfere with the movements of the sturgeon.

The spawning sturgeon during their runs to the spawning grounds and while on the spawning beds should have rigorous protection from nets, set-lines, spears and other means of capture.

If the sturgeon is not going to have protection from these unorganized factors which destroy it then the commercial fishermen should be allowed to fish for it and while exterminating it secure some revenue.

If the sturgeon is receiving the necessary protection against these insinuating destructive forces then it should be protected against indiscriminate fishing and should only be fished under a carefully controlling and limiting license.

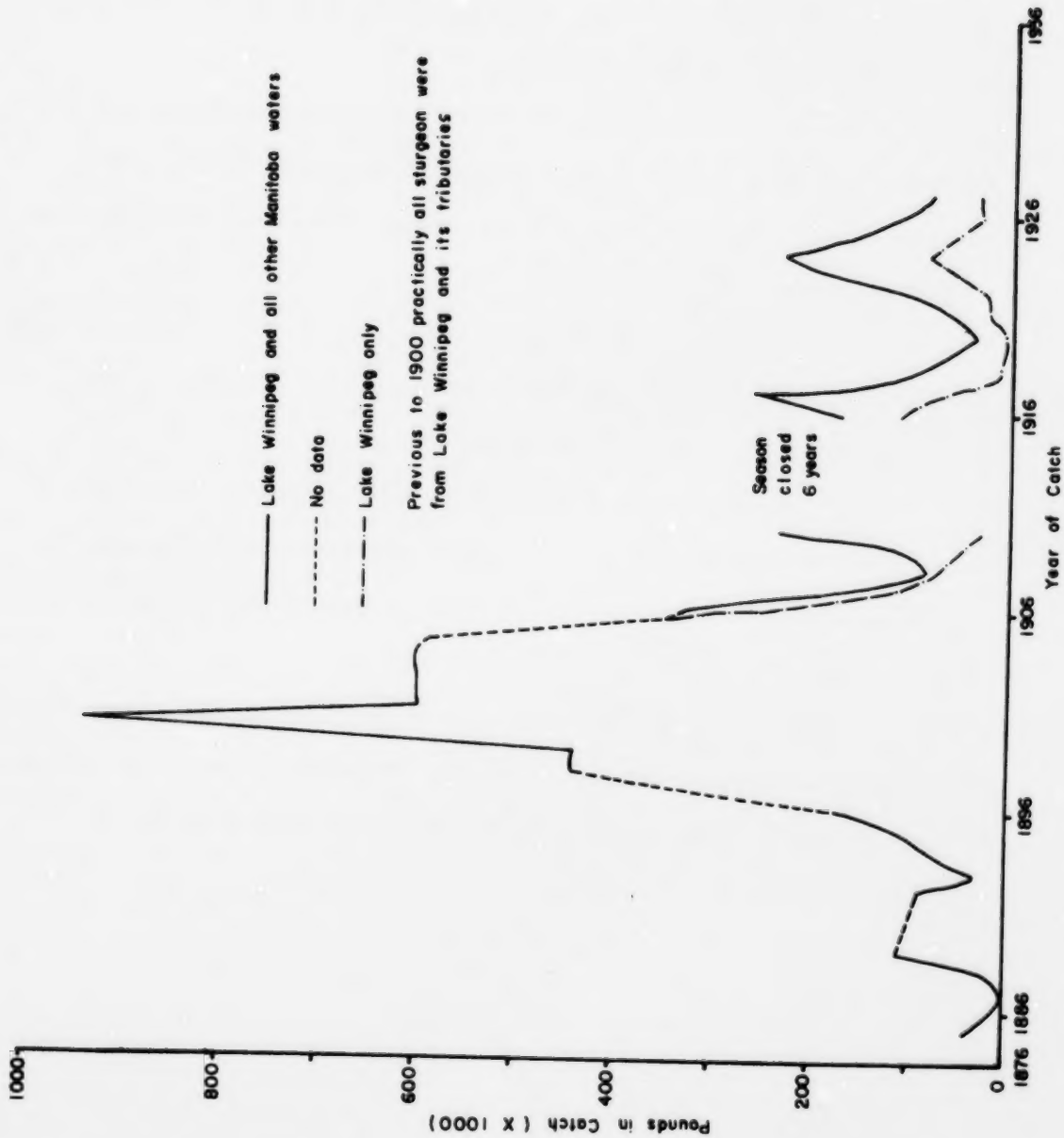
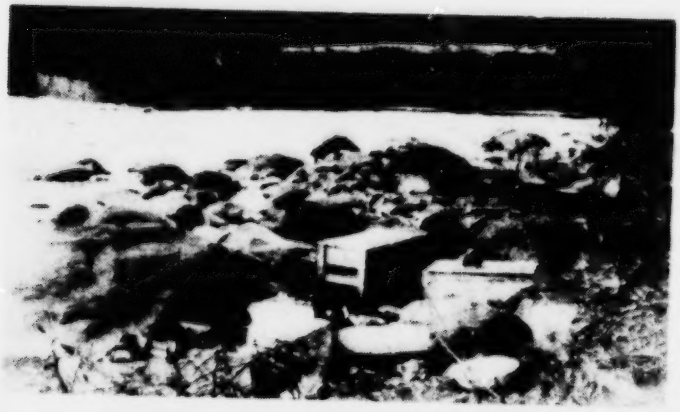



Figure 1. Trends in Manitoba Sturgeon fishery.

CULTURING STURGEON EGGS ON THE NIPIGON RIVER, ONTARIO

FLOATING HATCHERY BOXES CONTAINING STURGEON EGGS



AQUARIA CONTAINING STURGEON FRY

DAM TO COLLECT WATER TO SUPPLY THE AQUARIA

The statistics of the theoretical catch are arrived at as follows:

| Year | Pounds | ¢/lb. | Value($) |
|---|---|---|---|
| 1885 | 100,000 | 5 | 5,000 |
| 1886 | 100,000 | 5 | 5,000 |
| 1887 | 100,000 | 6 | 6,000 |
| 1888 | 100,000 | 5 | 5,000 |
| 1889 | 100,000 | 5 | 5,000 |
| 1892 | 100,000 | 5 | 5,000 |
| 1893 | 100,000 | 3 | 3,000 |
| 1894 | 100,000 | 3 | 3,000 |
| 1895 | 100,000 | 4 | 4,000 |
| 1896 | 100,000 | 5 | 5,000 |
| 1898 | 100,000 | 5 | 5,000 |
| 1899 | 100,000 | 6 | 6,000 |
| 1900 | 100,000 | 6 | 6,000 |
| 1901 | 100,000 | 6 | 6,000 |
| 1902 | 100,000 | 10 | 10,000 |
| 1903 | 100,000 | 12 | 12,000 |
| 1904 | 100,000 | 12 | 12,000 |
| 1906 | 100,000 | 10 | 10,000 |
| 1907 | 100,000 | 10 | 10,000 |
| 1908 | 100,000 | 10 | 10,000 |
| 1909 | 100,000 | 12 | 12,000 |
| 1910 | 100,000 | 14 | 14,000 |
| 1911 | 100,000 | 10 | 10,000 |
| 1912 | 100,000 | 10 | 10,000 |
| 1913 | 100,000 | 10 | 10,000 |
| 1914 | 100,000 | 10 | 10,000 |
| 1915 | 100,000 | 10 | 10,000 |
| 1916 | 100,000 | 10 | 10,000 |
| 1917 | 100,000 | 20 | 20,000 |
| 1918 | 100,000 | 23 | 23,000 |
| 1919 | 100,000 | 13 | 13,000 |
| 1920 | 100,000 | 30 | 30,000 |
| 1921 | 100,000 | 36 | 36,000 |
| 1922 | 100,000 | 45 | 45,000 |
| 1923 | 100,000 | 50 | 50,000 |
| 1924 | 100,000 | 50 | 50,000 |
| 1925 | 100,000 | 42 | 42,000 |
| 1926 | 100,000 | 54 | 54,000 |
| 1927 | 100,000 | 54 | 54,000 |
| 1928 | 100,000 | 57 | 57,000 |
| 1929 | 100,000 | 40 | 40,000 |
| 1930 | 100,000 | 30 | 30,000 |
| 1931 | 100,000 | 25 | 25,000 |
| 1932 | 100,000 | 14 | 14,000 |
| 1933 | 100,000 | 15 | 15,000 |
| 1934 | 100,000 | 15 | 15,000 |
| 1935 | 100,000 | 15 | 15,000 |
| | 4,700,000 | | $ 847,000 |

Production of sturgeon and caviar (pounds) from other Manitoba waters.

| Year | The Pas Area | | | Nelson River and tributaries Hudson Bay etc. | | Lake of the Woods (Buffalo Bay) |
|---|---|---|---|---|---|---|
| | | Sturgeon | Caviar | Sturgeon | Caviar | Sturgeon |
| 1906 | Cedar, Moose, Atikomeg, Cormorant | 125,000 | 15,000 | - | - | - |
| 1907 | " " " " | 20,000 | 2,000 | 7,000 | 500 | - |
| 1908 | | - | - | 8,000 | 2,500 | - |
| 1909 | Cedar | 16,400 | - | 25,700 | - | - |
| 1910 | Cedar, Lac du Bonnet (20,500) (173,200) | 194,300 | 3,000 | 9,000 | - | - |
| 1915 | Cumberland, Sturgeon | 15,300 | - | - | - | - |
| 1916 | Cedar, Cumberland | 36,100 | 100 | - | - | - |
| 1917 | Cumberland | 26,800 | - | 150,000 | 3,600 | - |
| 1918 | Lakes Combined | 32,200 | 100 | 68,000 | 600 | - |
| 1919 | " " | 66,500 | 200 | - | - | - |
| 1920 | " " | 32,200 | - | - | - | - |
| 1921 | " " | 36,600 | 820 | - | - | - |
| 1922 | " " | 62,300 | 480 | - | - | - |
| 1923 | " " | 124,300 | 1,100 | - | - | - |
| 1924 | " " | 146,800 | 3,180 | - | - | 500 |
| 1925 | " " | 97,800 | 1,900 | - | - | 200 |
| 1926 | " " | 76,800 | 1,323 | - | - | 200 |
| 1927 | " " | 48,200 | 610 | - | - | - |
| 1928 | " " | - | - | - | 300[1] | - |
| 1929 | " " | 7,100 | - | - | - | 100 |
| 1930 | " " | 2,100 | - | - | - | - |
| 1931 | " " | 600 | - | - | - | - |
| 1932 | " " | 1,000 | - | - | - | - |
| 1933 | " " | 90 | - | - | - | - |

[1] Nelson River.

STATISTICS OF MANITOBA STURGEON FISHERY

| | Lake Winnipeg and tributaries Red and Assiniboine R. etc. | | | | Total for the Province | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Sturgeon | | Caviar | | Sturgeon | | | Caviar | | |
| Year | Pounds | Value | Pounds | Value | Pounds | ¢ | Value | Pounds | $ | Value |
| 1876 | 600 | $ 3,000 | - | - | 600 | 5 | $ 3,000 | - | - | - |
| 1877 | 670 | 3,350 | - | - | 670 | 5 | 3,350 | - | - | - |
| 1878 | - | - | - | - | - | - | - | - | - | - |
| 1879 | - | - | - | - | - | - | - | - | - | - |
| 1880 | - | - | - | - | - | - | - | - | - | - |
| 1881 | - | - | - | - | - | - | - | - | - | - |
| 1882 | - | - | - | - | - | - | - | - | - | - |
| 1883 | - | - | - | - | - | - | - | - | - | - |
| 1884 | - | - | - | - | - | - | - | - | - | - |
| 1885 | 42,000 | 2,100 | - | - | 42,000 | 5 | 2,100 | - | - | - |
| 1886 | 18,000 | 900 | - | - | 18,000 | 5 | 900 | - | - | - |
| 1887 | 4,000 | 240 | - | - | 4,000 | 6 | 240 | - | - | - |
| 1888 | 27,980 | 1,339 | - | - | 27,980 | 5 | 1,399 | - | - | - |
| 1889 | 110,738 | 5,536 | - | - | 110,736 | 5 | 5,536 | - | - | - |
| 1890 | - | - | - | - | - | - | | - | - | - |
| 1891 | - | - | - | - | - | - | | - | - | - |
| 1892 | 93,090 | 4,654 | - | - | 93,090 | 5 | 4,654 | - | - | - |
| 1893 | 37,200 | 1,116 | - | - | 37,200 | 3 | 1,116 | - | - | - |
| 1894 | 76,270 | 2,288 | - | - | 76,270 | 3 | 2,288 | - | - | - |
| 1895 | 104,240 | 4,170 | - | - | 104,240 | 4 | 4,170 | - | - | - |
| 1896 | 175,748 | 8,787 | 7 kegs | - | 175,748 | 5 | 8,787 | 7 kegs | - | - |
| 1897 | - | - | - | - | - | - | - | - | - | - |
| 1898 | 447,510 | 22,375 | 8,520 | $ 4,260 | 447,510 | 5 | 22,375 | 8,520 | .50 | $ 4,260 |
| 1899 | 444,787 | 26,687 | 15,745 | 7,872 | 444,787 | 6 | 26,687 | 15,745 | .50 | 7,872 |
| 1900 | 981,500 | 58,890 | 17,500 | 8,750 | 981,500 | 6 | 58,890 | 17,500 | .50 | 8,750 |
| 1901 | 600,000 | 36,000 | 20,000 | 20,000 | 600,000 | 6 | 36,000 | 20,000 | 1.00 | 20,000 |
| 1902 | 600,000 | 60,000 | 30,000 | 30,000 | 600,000 | 10 | 60,000 | 30,000 | 1.00 | 30,000 |
| 1903 | 600,000 | 72,000 | 25,000 | 25,000 | 600,000 | 12 | 72,000 | 25,000 | 1.00 | 25,000 |
| 1904 | 600,000 | 72,000 | 35,000 | 35,000 | 600,000 | 12 | 72,000 | 35,000 | 1.00 | 35,000 |
| 1905 | - | - | - | - | - | - | - | - | - | - |
| 1906 | 200,000 | 20,000 | 22,000 | 22,000 | 325,000 | 10 | 32,500 | 37,000 | 1.00 | 37,000 |
| 1907 | 150,000 | 15,000 | 15,000 | 15,000 | 177,000 | 10 | 17,700 | 17,500 | 1.00 | 17,500 |
| 1908 | 79,500 | 7,950 | 10,300 | 10,300 | 87,500 | 10 | 8,750 | 12,800 | 1.00 | 12,800 |
| 1909 | 52,200 | 6,264 | 3,600 | 4,500 | 94,300 | 12 | 11,316 | 36,000 | 1.25 | 4,500 |
| 1910 | 30,200 | 4,228 | 4,000 | 5,000 | 233,500 | 14 | 32,690 | 6,400 | 1.25 | 8,000 |
| 1911 | - | - | - | - | - | - | - | - | - | - |
| 1912 | - | - | - | - | - | - | - | - | - | - |
| 1913 | - | - | - | - | - | - | - | - | - | - |
| 1914 | - | - | - | - | - | - | - | - | - | - |
| 1915 | - | - | - | - | 15,300 | - | - | - | - | - |
| 1916 | 115,800 | 13,896 | 2,200 | 2,200 | 181,900 | 10 | 20,506 | 2,300 | .90 | 2,275 |
| 1917 | 85,300 | 17,060 | 1,900 | - | 262,100 | 20 | 51,080 | 5,500 | - | - |
| 1918 | 12,500 | 3,015 | 640 | - | 113,700 | 23 | 26,116 | 1,340 | - | - |
| 1919 | 12,400 | 1,612 | - | - | 78,900 | 13 | 10,460 | - | - | - |
| 1920 | 7,500 | 2,100 | - | - | 39,700 | 30 | 11,516 | 200 | 1.00 | 400 |
| 1921 | 20,600 | 8,019 | 420 | 630 | 57,200 | 36 | 23,579 | 1,240 | 1.50 | 2,270 |
| 1922 | 25,100 | 11,405 | 200 | 350 | 87,400 | 45 | 31,022 | 880 | 1.50 | 1,475 |
| 1923 | 52,700 | 27,840 | 770 | 1,505 | 177,000 | 50 | 88,030 | 1,880 | 2.20 | 4,255 |
| 1924 | 88,600 | 44,340 | 800 | 1,000 | 235,900 | 50 | 122,251 | 3,980 | 1.10 | 4,234 |
| 1925 | 69,700 | 29,319 | 550 | 825 | 167,700 | 42 | 71,252 | 2,440 | 1.00 | 1,725 |
| 1926 | 30,900 | 17,266 | 200 | 300 | 108,000 | 54 | 58,074 | 1,523 | 1.50 | 2,353 |
| 1927 | 33,800 | 19,540 | 300 | 450 | 82,000 | 54 | 44,690 | 910 | 1.10 | 1,050 |
| 1928 | - | - | - | - | 600 | 57 | 345 | - | - | - |
| 1929 | - | - | - | - | 7,100 | 40 | 2,840 | - | - | - |
| 1930 | - | - | - | - | 2,100 | 30 | 630 | - | - | - |
| 1931 | - | - | - | - | 600 | 25 | 150 | - | - | - |
| 1932 | - | - | - | - | 1,000 | 14 | 140 | - | - | - |
| 1933 | - | - | - | - | 600 | 15 | 90 | - | - | - |
| 1934 | - | - | - | - | - | 15 | - | - | - | - |
| 1935 | - | - | - | - | - | 15 | - | - | - | - |
| Totals | 6,029,860 | $ 628,085 | 214,645 | $ 194,942 | 7,400,860 | 15 | $1,293,812 | 251,258 | | $ 230,719 |